ADDENDUM TO THE STATUS REVIEW OF *Howellia aquatilis*

U.S.D.A. FOREST SERVICE - REGION 1

FLATHEAD NATIONAL FOREST

MONTANA

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I. INTRODUCTION

This report represents an addendum to the status review of Howellia aquatilis, a sensitive plant species that occurs on the Flathead National Forest (Shelly 1988). Additional field surveys were conducted during the summer of 1988, in areas on the Flathead National Forest that had not previously been studied. These areas included ponds and wetlands in or adjacent to the Elk, Glacier, and Kraft creek drainages (Missoula County). Also, surveys were conducted in the vicinity of Salmon Prairie (Lake County). Sixty-seven sites that had not been previously inventoried were surveyed; of these, three were found to contain previously undocumented populations of H. aquatilis. This addendum includes maps of the locations of all areas surveyed in 1988, and maps and element occurrence print-outs for the three newly discovered populations.

Additionally, monitoring studies were established for five populations (two in the Condon Creek area, and three in the Lost Creek-Cilly Creek area). These studies consist of transects along which line-intercept data were collected for H. aquatilis and the dominant associated species. The data have been used to estimate the percent cover of these species within the habitats. This addendum includes the initial results, and a preliminary assessment of the suitability of this technique for monitoring population trends and response to management activities.

II. SPECIES INFORMATION

A. REVIEW OF PRESENT STATUS

1. **FEDERAL STATUS:** A rangewide status report on H. aquatilis has been prepared for the U.S. Fish and Wildlife Service (Shelly and Moseley 1988). On the basis of information obtained from all five states in which H. aquatilis is historically (OR, CA) or currently (ID, MT, WA) known to occur, and an assessment of known and potential threats to populations, the species was recommended for inclusion in Category 1 of the U.S. Fish and Wildlife Service Notice of Review. Category 1 taxa are those "...for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species. Presently, data are being gathered concerning precise habitat needs and, for some of the taxa, concerning the precise boundaries for critical habitat designations. Development and publication of proposed rules on these taxa are anticipated..." As of the preparation of this addendum, the U.S.

Fish and Wildlife Service has not issued a decision on this recommendation.

2. **STATE STATUS:** In Montana, the rank of H. aquatilis has been changed to S2 (6-20 sites in the state).

B. **UPDATE OF GEOGRAPHICAL DISTRIBUTION (MONTANA):** Prior to 1988, 348 wetland sites in the Swan Valley (Lake and Missoula counties) had been surveyed for the presence of H. aquatilis; the species was found in 52 of them (Shelly 1988). Field surveys were continued in 1988. An additional 67 sites were surveyed, and three new populations were found. Thus, H. aquatilis is now known from 55 populations, out of a total of 415 wetland sites that have been surveyed. These 55 populations are clustered in nine areas within the Swan Valley.

Element occurrence print-outs for the three new locations are provided in Section V, pp. 9-11. The locations of the 67 sites surveyed in 1988, and the three new populations, are indicated on the maps in Section V, pp. 12-15.

C. **POPULATION DEMOGRAPHY AND MONITORING STUDIES:** Details regarding population size and condition for the three newly discovered occurrences are summarized in Table 1.

During 1988, monitoring studies were initiated for five populations (occurrence numbers 008, 009, 013, 020, and 027). The locations of these occurrences are shown in the previous status review (Shelly 1988, pp. 96 and 98). The goals of these studies are 1.) to assess the suitability of the line-transect method for monitoring H. aquatilis, and 2.) to begin collection of information to assess the ecological relationships, and responses to adjacent land use, of the species.

METHODS: At each of the five ponds studied, a line-transect was established, using steel posts for the endpoints. The transects varied in length from 42.9 to 50.0 m. Within each pond, they were subjectively placed through portions of the habitat that appeared to be most representative of each occurrence. Measurements of the length of canopy coverage bisected by the tape, for H. aquatilis and the major associated species, were recorded to the nearest centimeter. The accumulated length occupied by a species out of the total meter tape length used for the sample is expressed as the percent cover for that species (Mueller-Dombois and Ellenberg 1974). In addition, photographic slides of each pond were taken (Section VI, p. 16), and measurements of pond depth were made at

TABLE 1. Population size and condition for *Howellia aquatilis* occurrences surveyed in 1988.

Occurrence number: 053
Site name: SALMON PRAIRIE
Acreage: 2
Population size and condition: EST. 200-300 PLANTS, ALONG MARGINS OF TWO AREAS THAT ARE CONNECTED BY HIGHER WATER IN EARLY SUMMER; PONDS BISECTED BY FENCE, WITH MOST PLANTS ON WEST (USFS) SIDE.

Occurrence number: 054
Site name: ELK CREEK
Acreage: 1
Population size and condition: EST. 400-500 PLANTS, PROBABLY MORE WHEN POND IS FULL.

Occurrence number: 055
Site name: ELK CREEK
Acreage: 1
Population size and condition: CA. 100 INDIVIDUALS (53 COUNTED); FOUND ONLY IN SOUTH END OF POND, AROUND MARGIN; DOES NOT OCCUPY ALL AVAILABLE HABITAT.

two points along each transect in four of the five ponds studied. The compass bearing of each transect was also recorded.

RESULTS: The initial results are presented in Table 2. There appears to be a rough correlation between a higher percent cover of H. aquatilis and a lower percent cover of the associated species. However, it was observed in the field that there is considerable variation throughout a given pond as to the patchiness of H. aquatilis and the other emergent plant species. Nonetheless, the results appear to provide a reasonable approximation of the relative abundance of each species, at least in the areas bisected by the transects. The method will allow for tracking changes in the abundance of each species along the transects.

The following difficulties regarding the line-transect method for monitoring H. aquatilis should be discussed:

i.) The method impacts the habitat; these impacts result from wading in the ponds to establish and read the transects. These impacts would not be expected to seriously affect the major associated emergent species, all of which are perennials with sturdy root systems. However, the annual root system and frail, submerged or floating habit of H. aquatilis make the species easily susceptible to physical disturbance. In addition, the bottom substrates of the pond habitats are disturbed by wading.

ii.) The annual life history of H. aquatilis, and the existence of seed banks (Lesica et al. 1987), result in yearly fluctuations in population size and areal extent. Annual differences in percent cover as measured along the monitoring transects may result in part from these fluctuations, which in turn may be due to a variety of factors (i.e., fluctuation in annual precipitation and temperature averages, land use adjacent to habitats). The dependence of H. aquatilis on an aquatic habitat that is highly influenced by these variable physical factors will make it difficult to determine the exact causes of population fluctuations.

To further assess these difficulties, it has been proposed that these transects be re-read in 1989 and 1990. Data from three years will hopefully provide a better understanding of these problems. In the interim, repeated qualitative surveys of all known populations have been recommended, to obtain population size estimates and assess response to habitat

TABLE 2. Monitoring transect data, *Howellia aquatilis* and major associated species, Swan Valley, Montana, 1988. Cover data expressed as percentage of canopy length bisected for each species, as measured along line-intercept transects.

Occurrence number	008	009	013	020	027
Date read	21 JUL	21 JUL	21 JUL	22 JUL	22 JUL
Transect length (m)	48.95	50.0	46.0	42.9	50.0
Transect bearing (°)	322	321	154	25	342
Water depth (dm/tape pt.(m))	not measured	3.1/20.0 3.2/40.0	1.7/15.0 1.8/30.0	2.72/10.0 2.64/23.0	1.96/15.0 1.50/30.0
Estimated % cover:					
Howellia aquatilis	8.21	7.06	6.44	26.29	1.80
Carex atherodes	-	-	-	-	9.40
Carex rostrata	19.10	-	19.37	9.88	14.96
Carex vesicaria	6.41	1.94	55.72	10.96	1.66
Eleocharis palustris	*	-	21.02	-	11.70
Equisetum fluviatile	-	98.26	-	-	-
Glyceria borealis	-	-	-	5.43	22.72
Phalaris arundinacea	3.47	-	-	-	24.76
Sium suave	53.81	6.18	3.78	6.83	1.95
Fallen logs	2.12	4.02	4.70	1.82	1.50

* - *Eleocharis palustris* is scattered throughout the pond (008).

disturbance in areas thus affected. Mapping of the approximate areas occupied by H. aquatilis within the ponds is an alternative monitoring method that will be applied to a sample of ponds in 1989. Lastly, frequency data will also be collected along the five established transects.

III. ASSESSMENT AND MANAGEMENT RECOMMENDATIONS

A. **THREATS TO THE NEWLY LOCATED POPULATIONS:** The Salmon Prairie (053) population is bisected by a fence; the west side is on Flathead National Forest land, and the east side is privately owned. The surrounding forest is currently intact, and no evidence of impending threats was observed.

The southernmost Elk Creek population (054) is partially owned and managed by Plum Creek Timber Company (south half), and by the Flathead National Forest (north half). Portions of the forests around the southern end of the wetland have been logged. However, this part of the site is slightly higher in elevation, and was dry on the date of survey; it did not appear to be suitable habitat for H. aquatilis. The north end, on National Forest land, is ca. 20 m. from a logging road (Flathead N.F. Rd. #9553); some impacts from construction were noted in the bordering forest, but the wetland habitat itself is currently intact.

The northernmost Elk Creek population (055) is entirely located on Flathead National Forest land. It is also adjacent to a logging road (spur road of #9553), but this road is closed by a locked gate. However, much of the forest on the west side of this pond is marked for a timber sale.

B. **MANAGEMENT RECOMMENDATIONS:** All three of these populations should be considered in further land use planning activities. Since the long-term effects of disturbance adjacent to the habitats of H. aquatilis are currently unknown, it is important that mitigation measures be adopted wherever possible (i.e., adequate buffer zones around the wetland habitats).

IV. LITERATURE CITED

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